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Heat Loss Correction in Closed Bomb Tests

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Abstract: Based on the fast change of pressure in closed bomb tests, a heat flux equation focused on pressure factor was deducted. A one-dimensional semi-infinite model of calculating inwall heat transfer in closed bomb tests was established and the expression of heat transfer was obtained. The model was validated by double base aromatic-3 (SF-3), TEGDN (TG) propellant and triple-base propellant. The results show that the error between corrected whole heat loss and theoretical whole heat loss is less than 10%, and the burning rate pressure index of SF-3 propellant obtained is close to the expected value.

Key words: materials science; triple-base propellant; closed bomb; heat transfer; heat loss